



# "Lower" Lower Beaver Creek

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# Introduction

We conducted a study on Lower Beaver creek and how it has changed over time in different aspects.

# Location

- Our section is "Lower" Lower Beaver Creek and this can be found near the Stark Street culvert and at
- $45^{\circ} 31' 05'' \text{ N } 122^{\circ} 23' 19'' \text{ W}$



# Background

In the lower section of lower beaver creek the Stark Street Culvert was added in 2017.

With the access of Google Earth we are allowed to see specific changes throughout the years especially before and after the culvert was inserted.



# Methods

Depths, measuring stadia rod is used to measure depths at 1 foot intervals.

Aerial photos, visual examination of aerial photos over multiple years comparing changes over those years.

Estimated Discharge with Oranges, we calculated the average time for the orange to float down a 100 ft section of the creek and used that to calculate discharge.

Wetland Measurements, we measured width and length of the wetlands.

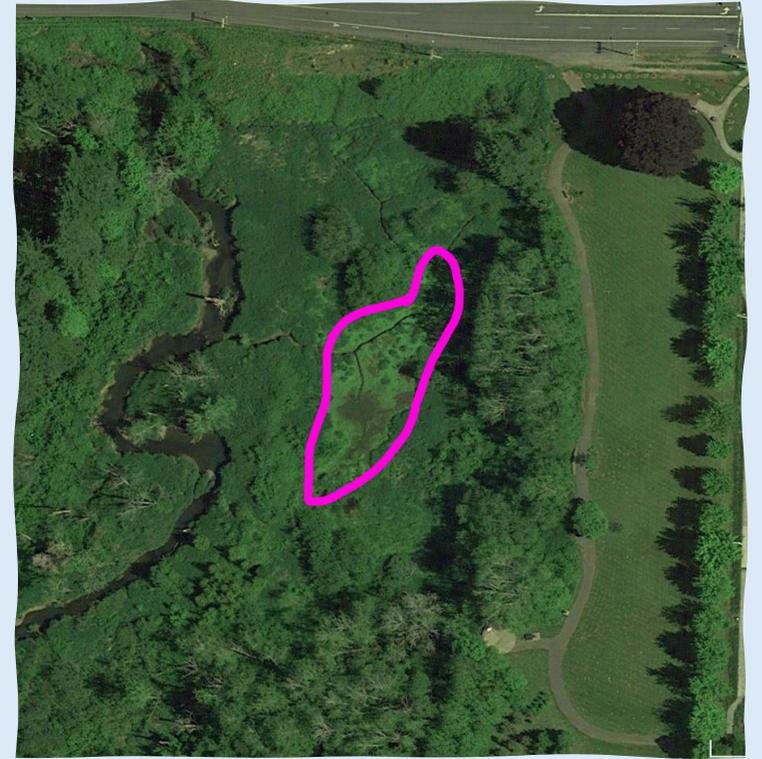
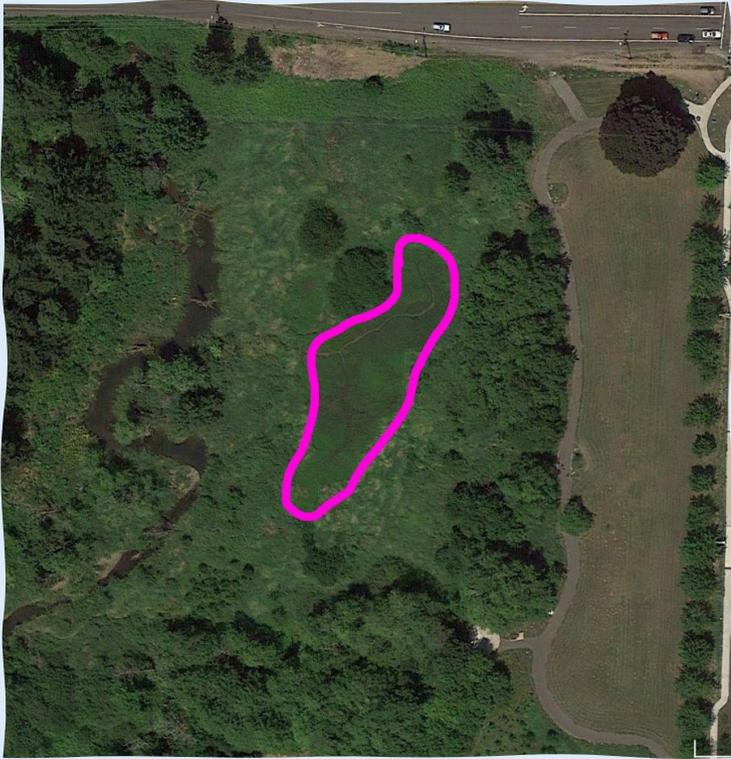


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# Wetlands

- We measured the wetlands on February 22nd of 2024 and they were 100ft in length and 78 ft wide.





# Wetlands: Before 2017

Prior to the new culvert being installed the wetlands changed very little.



# Wetlands: After 2017

- After 2017 the wetlands began to shrink and disappeared by 2021.
- Between 2021 and 2023, the wetlands began to reappear.

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## Gley on Cut Banks

- The Gley that is found on the cut banks of the creek is due to the wetlands and shows evidence that the wetlands have been there in the past.



# Wildlife

During our study, we saw ducks and deer

Ducks were seen on a a "Low" discharge day

Deer were seen on a "Average" Discharge day.



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# Discharge

- Discharge was measured on two different days by taking the average time it took for an orange to float down a 100 foot section of the creek.
- On 2/8 the calculated discharge was  $28.7 \text{ ft}^3/\text{s}$ , compared to actual discharge measured by USGS station downstream  $24.6 \text{ ft}^3/\text{s}$ .
- On 2/13 the calculated discharge was  $21.5 \text{ ft}^3/\text{s}$ , compared to actual discharge of  $17.2 \text{ ft}^3/\text{s}$ .
- There was a high flow event (pictured right) on 2/29/2024, where peak discharge was  $502 \text{ ft}^3/\text{s}$ .



# Discharge on High Flow Event

- On 02/29/2024 "High Flow Event" there was a big difference between "Gage Height, feet" and discharge cubic feet per second.

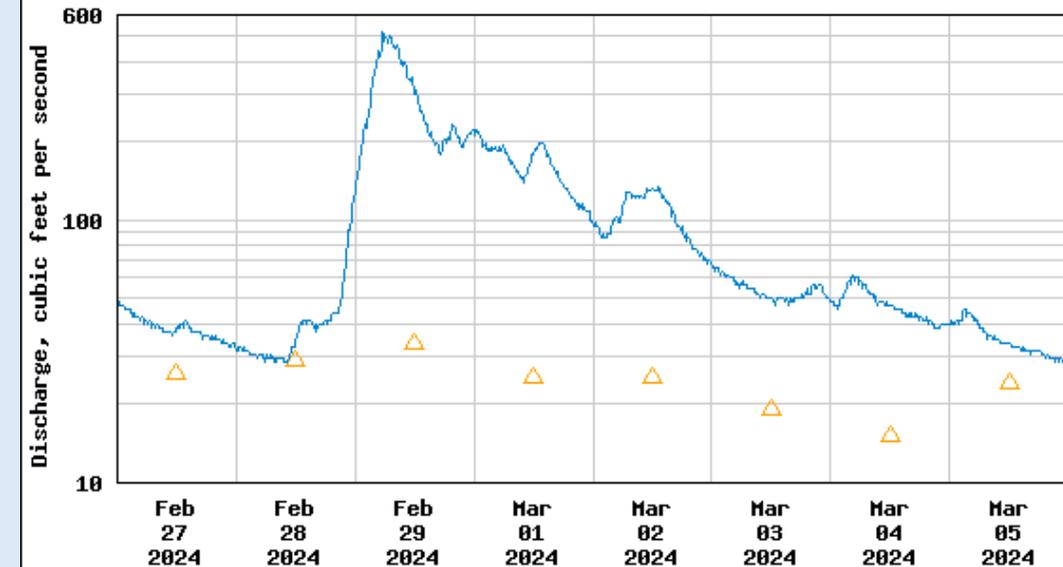
## Beaver Creek at Troutdale, OR - 14142800

February 16, 2024 - March 17, 2024

Gage height, feet



### USGS 14142800 BEAVER CREEK AT TROUTDALE, OR



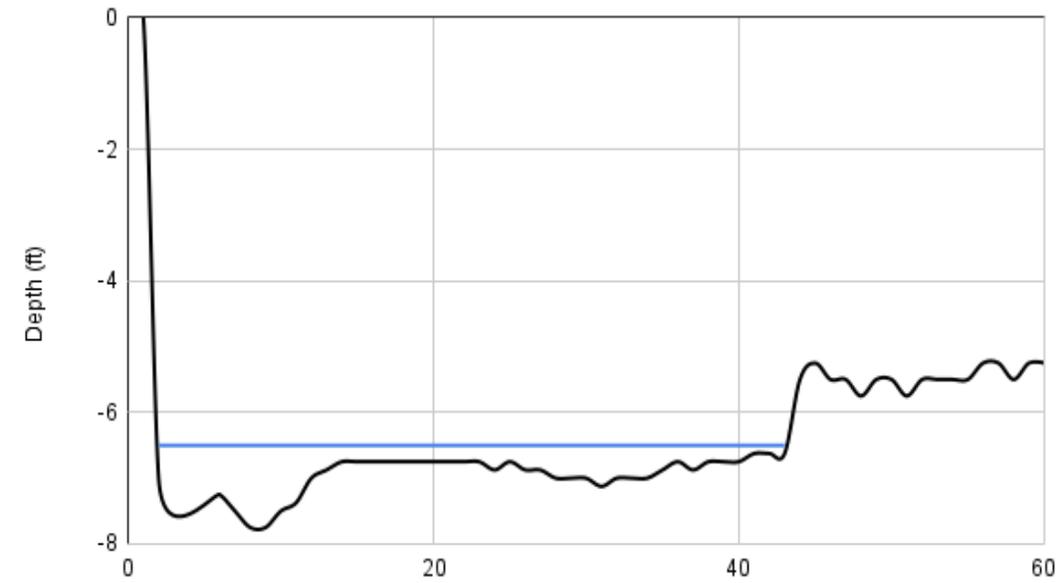
----- Provisional Data Subject to Revision -----

△ Median daily statistic (23 years) — Discharge

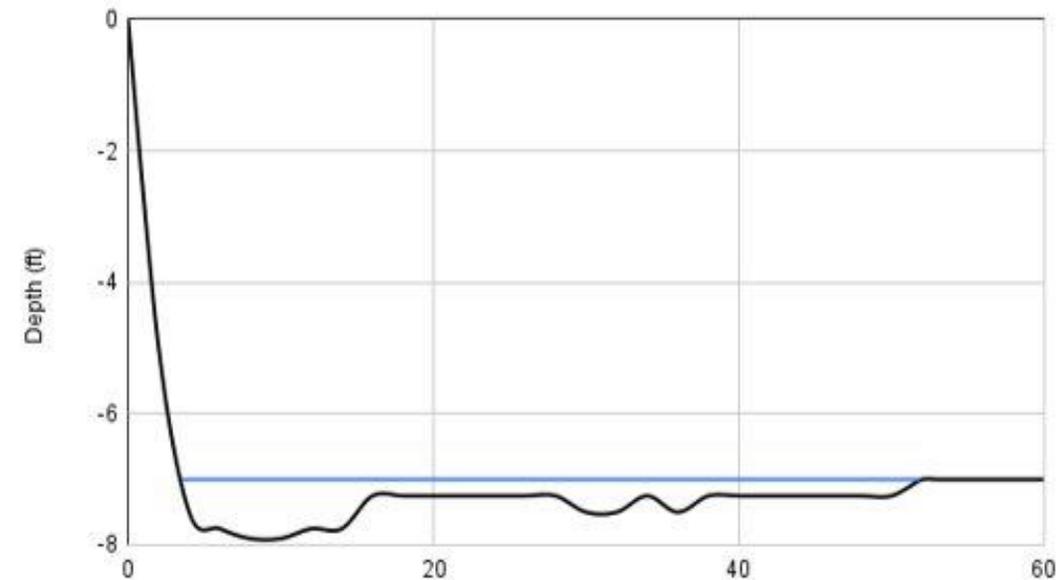
# Cross Sections

- Cross sectional data was collected on February 1st at three locations, and then collected again at section A on March 7th, after a high flow event.
- Deposition of sediments near the cut bank and the removal of sediments on the point bar was noticed following the high flow event.

A-A' Cross Section (2/1/2024)



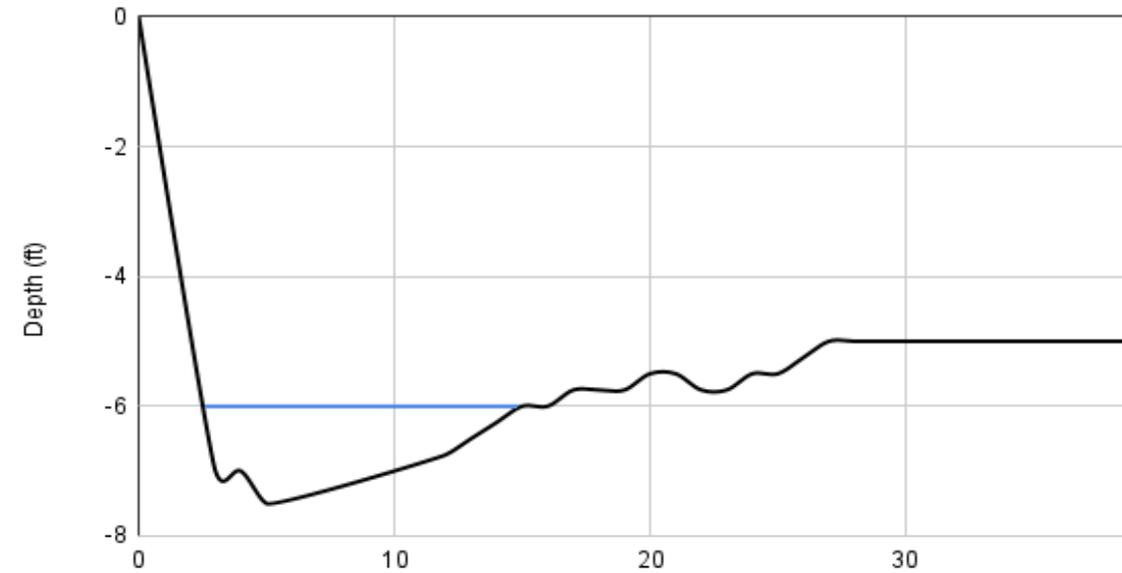
A-A' Cross Section (3/7/2024)



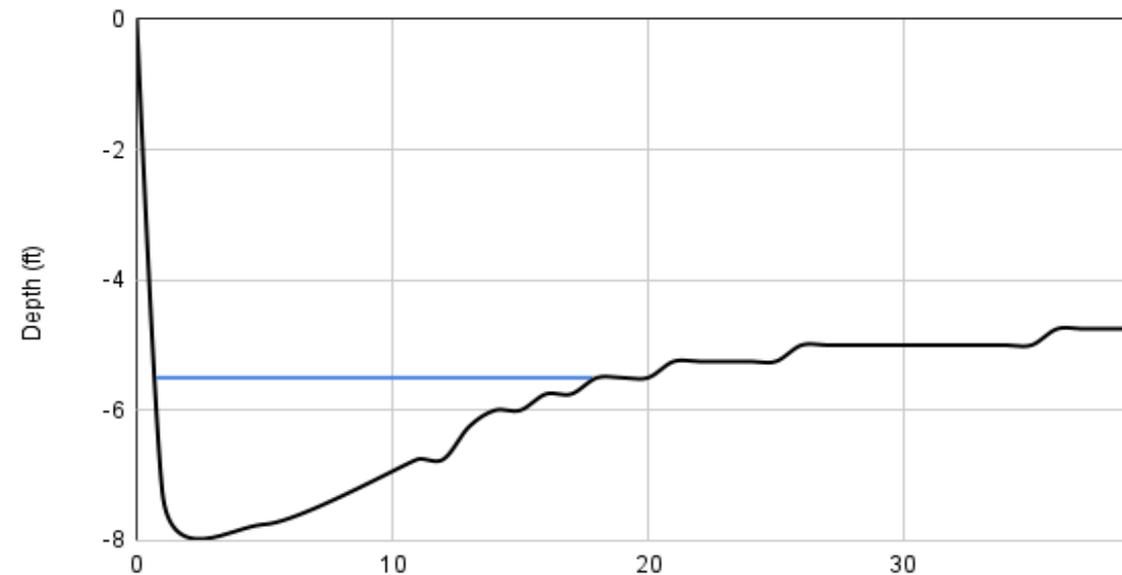
# Cross Sections

- At each location, the cross section starts on a steep cut bank and ends on a point bar.
- C-C' is at a location where the main channel of the stream flowed for many years, and has cut a very deep channel along the cut bank.

B-B' Cross Section (2/1/2024)



C-C' Cross Section (2/1/2024)



Beaver Creek 7/2007

Legend



Google Earth

Image © 2024 Metro, Portland, Oregon



200 ft

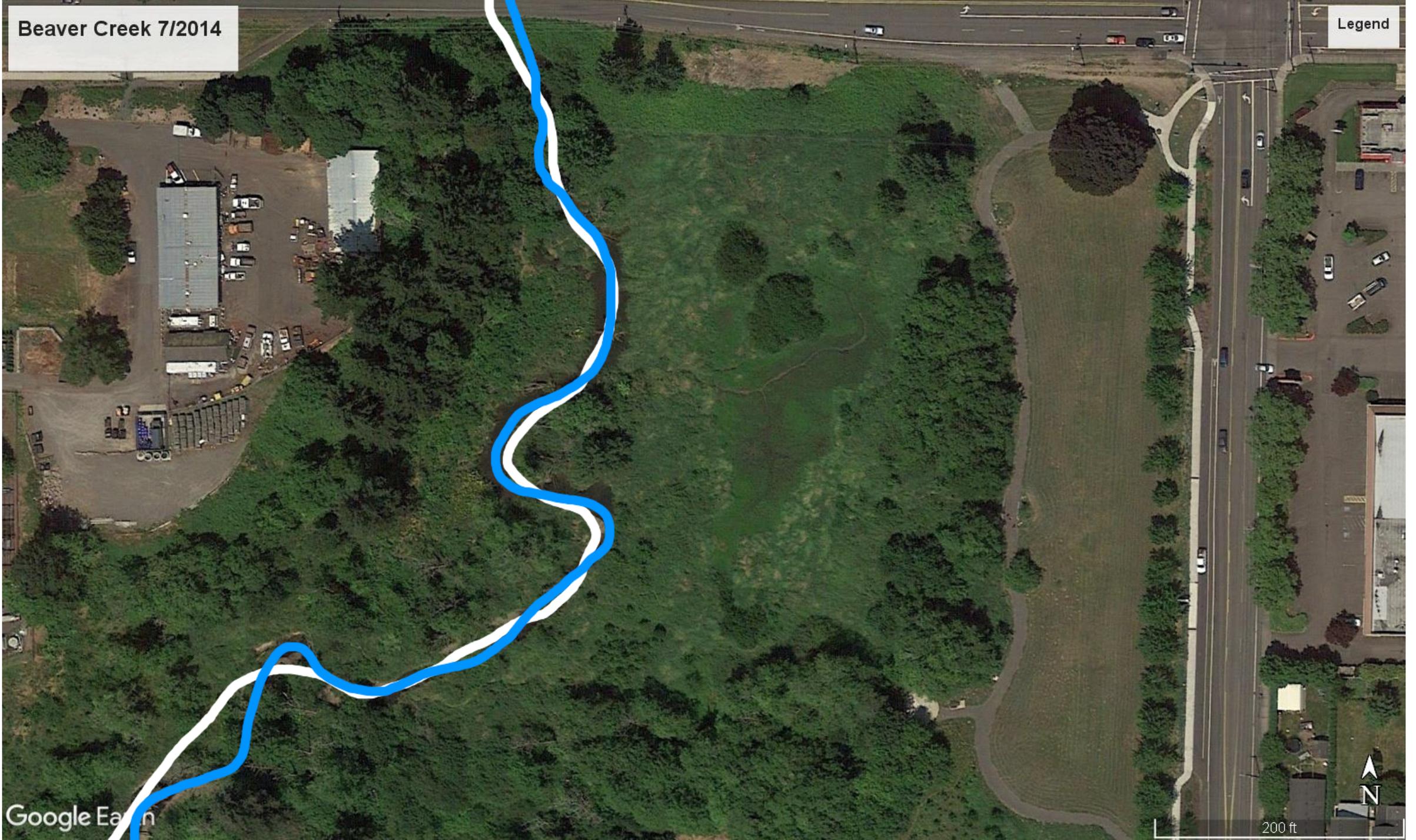
Beaver Creek 7/2014

Legend

Google Earth

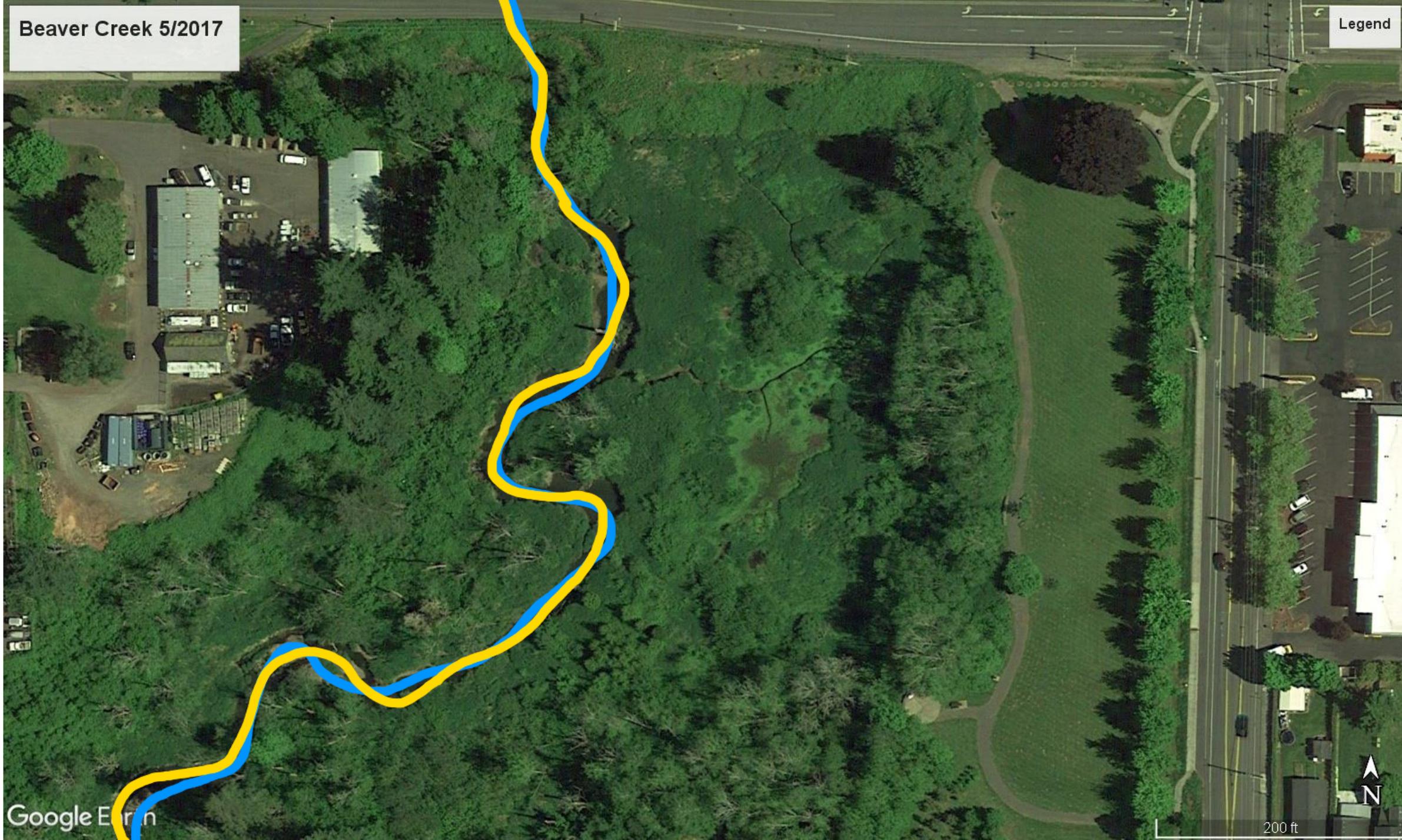


200 ft



Beaver Creek 5/2017

Legend



Google Earth

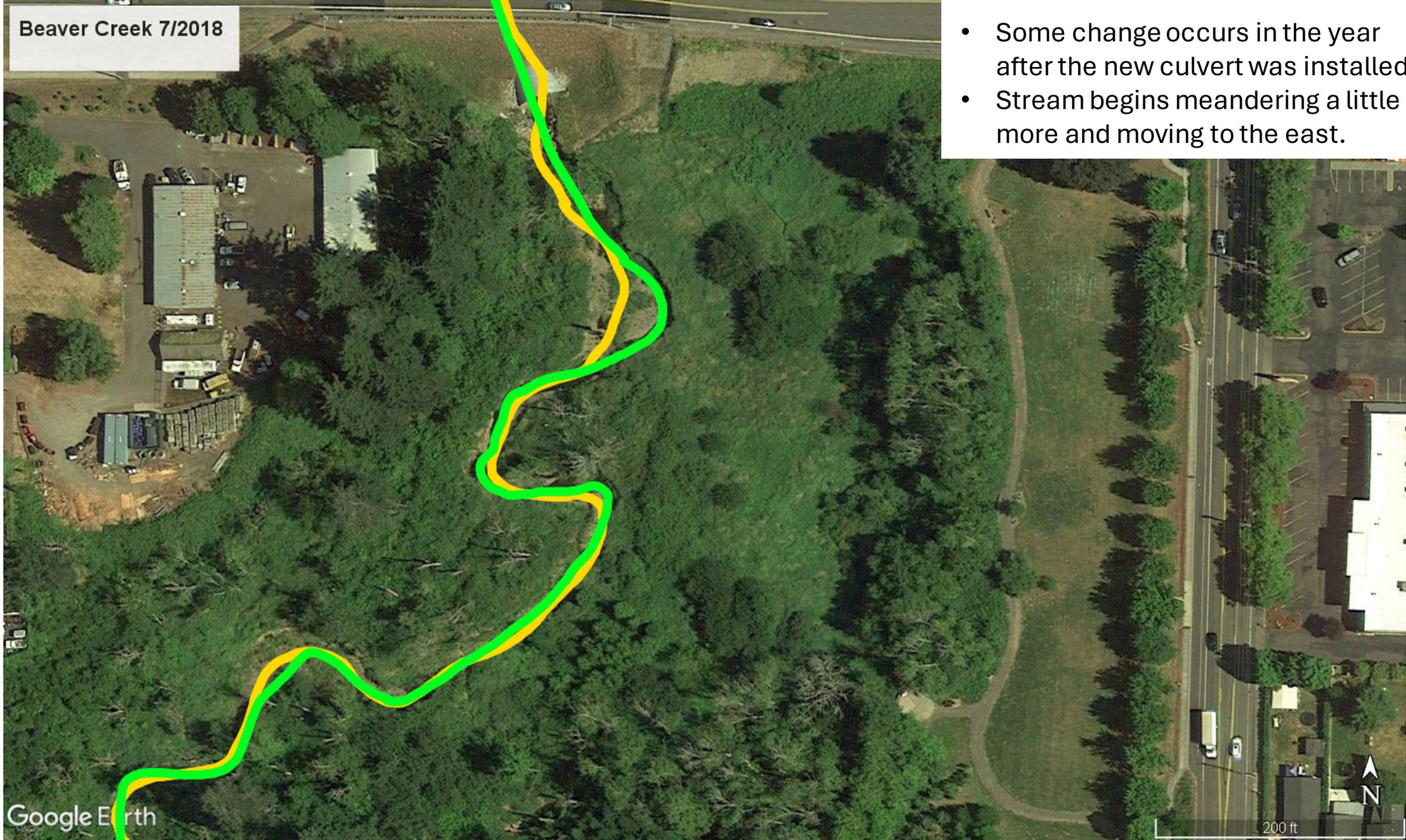
200 ft



# 2007-2017

- Very little change in the stream channel in this 10 year span
- The old culvert acted as a dam, which raised the stream's base level and prevented a large amount of erosion from occurring.

Beaver Creek 7/2018



- Some change occurs in the year after the new culvert was installed.
- Stream begins meandering a little more and moving to the east.

Google Earth

200 ft



Beaver Creek 5/2021

- Stream changes outlined on previous slide continue between 2018 and 2021.



Google Earth

200 ft



Beaver Creek 5/2023

- Significant change occurred between 2021 and 2023.
- Stream moved even further east, and has eroded a significant amount of sediment.



Google Earth

Image © 2024 Airbus



200 ft

Beaver Creek 5/2023

- Comparison of 2007 stream channel (white) and 2023/4 stream channel (red).



Google Earth

Image © 2024 Airbus

200 ft



# Future Studies

Some future studies that should be conducted are:

- Measuring the amount of Sediments and how far they have been moved
- Possibility of Trees being inserted into Beaver Creek to stop fast-paced erosion

# Conclusion

This project has not only shown the changes of different aspects over time, but has taught us about geomorphology with a hands on experience in the field. We learned how to do cross sections, measure for depth, measuring discharge, and examine aerial photos.

# Citations

“Beaver Creek at Troutdale, Or.” *USGS Water Data for the Nation*, [waterdata.usgs.gov/monitoring-location/14142800/#parameterCode=00065&period=P7D&showMedian=false](https://waterdata.usgs.gov/monitoring-location/14142800/#parameterCode=00065&period=P7D&showMedian=false). Accessed 17 Mar. 2024.

*USGS Current Conditions for USGS 14142800 Beaver Creek at Troutdale, Or*, [waterdata.usgs.gov/nwis/uv?cb\\_00060=on&cb\\_00065=on&format=gif\\_default&site\\_no=14142800&legacy=1&period=&begin\\_date=2024-02-27&end\\_date=2024-03-05](https://waterdata.usgs.gov/nwis/uv?cb_00060=on&cb_00065=on&format=gif_default&site_no=14142800&legacy=1&period=&begin_date=2024-02-27&end_date=2024-03-05). Accessed 17 Mar. 2024.